## Space Weather Forecast

Issued on Monday, 08 July 2024 at 13:20 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

**Space Weather Forecast Headline: Further Moderate-class flares likely.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Moderate with a number of Moderate-class flares coming from a region over the southeastern limb. There are seven sunspot regions on the disc. The largest region is in the southeast, showing some magnetic complexity. The second largest region is now in the northwest, but is soon to rotate out of view around the western limb. All other groups appear small and relatively simple at present.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed during the past 24 hours.

**Solar Wind / Geomagnetic Activity:** Solar winds as observed by ACE at L1 peaked at slightly elevated levels of 417 km/s at 08/0014 UTC possibly as a result of a weak connection to a coronal hole in the northwest. Since then the solar winds have been on a slow decline back to current levels of around 380 km/s. The Interplanetary Magnetic Field was largely weak however it has risen in recent hours to moderate levels, with north-south component varying weakly throughout.

The resulting geomagnetic activity was Quiet to Unsettled (Kp1-3).

**Energetic Particles / Solar Radiation:** Solar radiation was measured at background levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** There is a likelihood of further Moderate-class flares, with a slight chance of Strong flares, most likely from the largest sunspot region in the southeast or from new regions that are likely to rotate over the southeastern limb in the coming days.

**Solar Wind / Geomagnetic Activity:** No Earth-directed CMEs feature in the forecast. The solar wind is most likely to be at slow-ambient levels for much of this period. A small coronal hole may give some minor enhancements on Day 1 (08 Jul). A second coronal hole, currently near south centre disc, could produce slightly elevated or elevated wind speeds later in the period, perhaps on Days 3-4 (10-11 Jul). Any significant geomagnetic response from either of these two coronal holes is unlikely due to Earth's proximity to the solstice.

Geomagnetic activity is expected to be mostly Quiet to Unsettled (Kp0-3) through the next four days, however there is a chance of the odd Active (Kp4) interval, most likely on Days 3-4 (10-11 Jul), due to potential fast wind influence.

**Energetic Particles / Solar Radiation:** Solar radiation storms are unlikely, but with a slight chance of reaching S1/Minor Radiation Storm or greater levels. This risk increases a little as the largest region currently in the southeast rotates towards centre disc and into a more geoeffective position.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 1 | 5 | 5 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 70 | 70 | 70 | 70 |
| Very Active | R3 to R5 X | No | 10 | 10 | 10 | 10 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 10 | 10 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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